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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,829	08/28/2003	Wataru Taki	2936-0194P	6644

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EXAMINER
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NGUYEN, MINH T

ART UNIT	PAPER NUMBER
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2816

DATE MAILED: 12/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/649,829

Applicant(s)

TAKI ET AL.

Examiner

Minh Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. Applicant's amendment filed on 9/28/04 has been received and entered in the case.

Claims 1-14 are pending. New grounds of rejections necessitated by the amendment are set forth below. This action is FINAL.

#### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 6, 8-9 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by US

Patent No. 5,060,297, issued to Ma et al.

As per claim 1, Ma discloses a frequency conversion apparatus (Fig. 2) comprising:

a high-frequency amplifier (amplifier 26, column 4, line 44, RF preamplifier) for amplifying an input high-frequency signal (INPUT);

a mixer (mixer 36, column 4, line 53) for mixing the amplified high-frequency signal applied through a variable filter (variable filter 28, column 4, line 49, tracking filter) with a local oscillation signal (column 4, lines 53-56);

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a filter (filter 38, BPF) for restricting a band of an output signal of the mixer to permit passage of only components within a predetermined band (this is merely a function of a bandpass filter); and

the variable filter (variable filter 28, column 4, line 49, tracking filter) provided between the high-frequency amplifier and the mixer, having a cut-off frequency that is controllable (column 5, lines 3-5),

wherein the high frequency amplifier shuts off reflected waves outside a pass band of the variable filter (this limitation is met because the amplifier 26 is positioned before the variable filter 28 and it has a single input and a single output), and

wherein the cut-off frequency of the variable filter is so controlled as to vary with a reception channel signal (column 5, lines 1-20 and table 1).

As per claim 2, the recited limitation is disclosed in column 8, lines 21-23, i.e., "low-pass filtering ...".

As per claim 6, the recited PLL reads on PLL 44 using VTUNE voltage for controlling oscillator 32.

As per claim 8, this claim is merely the method to operate a frequency conversion apparatus having the structure recited in claim 1. Since Ma teaches the circuit, he inherently teaches the recited method.

As per claims 9 and 13, these claims are rejected for the same reasons noted in claims 2 and 6, respectively.

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3. Claims 1, 3, 6, 8, 10 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 6,112,070, issued to Katsuyama et al.

As per claim 1, Katsuyama discloses a frequency conversion apparatus (Fig. 1) comprising:

a high-frequency amplifier (LNA 3, low noise amplifier) for amplifying an input high-frequency signal (from antenna 1);

a mixer (MIX 5) for mixing an output signal of the high-frequency amplifier with a local oscillation signal (VCO 8) through a variable filter (variable BPF 4);

a filter (IF-BPF 6) for restricting a band of an output signal of the mixer to permit passage of only components within a predetermined band (this is merely the function of a bandpass filter); and

the variable filter (variable BPF 4) provided between the high-frequency amplifier and the mixer, having a cut-off frequency is controllable (see Fig. 2),

wherein the high frequency amplifier shuts off reflected waves outside a pass band of the variable filter (this limitation is met because the amplifier is positioned before the variable filter and it has a single input and a single output), and

wherein the cut-off frequency of the variable filter is so controlled as to vary with a reception channel signal (also see Fig. 2).

As per claim 3, the recited variable bandpass filter reads on BPF 4.

As per claim 6, the recited PLL reads on PLL 9 which controls oscillator 8.

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As per claim 8, this claim is merely the method to operate a frequency conversion apparatus having the structure recited in claim 1. Since Katsuyama teaches the circuit, he inherently teaches the recited method.

As per claims 10 and 13, these claims are rejected for the same reasons noted in claims 3 and 6, respectively.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-5, 7-8, 11-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,010,400, issued to Oto.

As per claim 1, Oto discloses a frequency conversion apparatus (Fig. 1) comprising:  
a high-frequency amplifier (25, column 3, lines 54, broadband amplifier) for amplifying an input high-frequency signal (from input 21);  
a mixer (22) for mixing an output signal of the high-frequency amplifier with a local oscillation signal (26);  
a filter (BPF 29) for restricting a band of an output signal of the mixer to permit passage of only components within a predetermined band (this is merely the function of a bandpass filter); and

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a variable filter (23 and 24, column 3, lines 25-26), wherein the cut-off frequency of the variable filter is so controlled as to vary with a reception channel signal.

Oto does not explicitly disclose the variable filter is located between the amplifier and the mixer as called for in the claim. Instead, Oto discloses the amplifier 25 is between the variable filter and the mixer.

However, as known by a person skilled in the art, switching the position of the variable filter (23 and 24) and the amplifier (25) in the Oto circuit provides the same signal at the input of the mixer 22, i.e., these arrangements are art recognized equivalent.

It would have been obvious to one skilled in the art at the time of the invention was made to rearrange the position of the variable filter (23 and 24) and the amplifier (25) in the Oto circuit. One skilled in the art would be motivated to do so because the artisan knows they are art recognized equivalent and by rearranging the parts in an electronic circuit, especially when the circuit is operated in a high frequency environment, interference noise (EMI) can be reduced.

As per claim 4, the recited variable lowpass, highpass filters read on LPF 24 and HPF 23, respectively.

As per claim 5, the recited variable highpass filter reads on HPF 23.

As per claim 7, Oto discloses the cut-off frequency is controllable and changed for every band (column 3, lines 55-57), VHF, UHF, ... but he does not explicitly the method for controlling is voltage synthesizing method as called for in the claim.

The examiner takes Official Notice the fact that using digital control via microprocessor for the purpose of tuning channels in household TV sets are popular and well-known practice because such method provides accurate tuning.

It would have been obvious to one skilled in the art at the time of the invention was made to use voltage synthesizing method to provide tuning for the Oto's TV tuner for the advantage discussed herein above.

As per claim 8, this claim is merely a method to operate a frequency conversion apparatus. Since the combination discussed above teaches the circuit, the recited method is inherently disclosed.

As per claims 11-12 and 14, these claims are rejected for the same reasons noted in claims 4-5 and 7, respectively.

### ***Response to Arguments***

5. Applicant's arguments filed on 9/28/04 have been fully considered but they are not persuasive.

Regarding the argument Ma does not teach or disclose a high frequency amplifier and a mixer. The recited signal combined with the local oscillation signal in the present invention claim is a high frequency signal, not an intermediate frequency signal as disclosed in Ma's reference.

The argument appears incorrect because claim 1 does not call for a high frequency signal being directly mixed with a local oscillation signal as argued. The evidence is that the claim requires the amplified high frequency signal is filtered by a variable filter before being mixed with a local oscillation signal. It is clear that if the variable filter is a low pass filter (see claim 2), the signal output from the variable filter which is supposed to mix with the local oscillation signal is no longer a high frequency signal. Further, it is noted that the term "high frequency" is a



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relatively term. Unless the specification explicitly defines the range, there is no reason for not considering the frequency range of 950-1450 MHz is not in a high frequency range. Further, Ma explicitly discloses the amplifier 26 is a radio frequency (RF) amplifier (column 4, line 44) which is the same as the RF amplifier shown in Fig. 1 of the present invention.

Regarding the argument Ma does not disclose or teach a PLL which controls the cut-off frequency of the variable filter by controlling a frequency of the local oscillation signal.

Ma's PLL circuit 44 in combination with the VTUNE voltage are used to control the frequency of the local oscillation signal (column 5, lines 15-20).

Regarding the argument the claim calls for a local oscillation signal, not an amplified local oscillation signal as disclosed in Katsuyama.

The examiner notes that the claim does not require the local oscillation signal must be directly fed to the mixer.

Regarding the argument Oto does not disclose the input high frequency signal is fed directly to the high frequency amplifier.

The examiner notes that this limitation is not seen in the claim. The applicant is further reminded the word "comprising" on line 1 of claim 1. The interpretation is clearly consistent with the structure shown in Fig. 1 of the present invention, i.e., BPF 10 is between the RF IN signal and the high frequency amplifier 12.

Regarding the argument Oto's HPF 23 and LPF 26 do not have a cut-off frequency that is controllable.

This limitation is explicitly disclosed in column 3, lines 55-56, i.e., "have variable cut-off frequencies".

Regarding the argument in Oto, the signals received by the highpass and lowpass filters are not amplified whereas the claim calls for the variable filter receives an amplified signal, and the reflected waves are shut-off by the amplifier

The examiner notes that by rearranging the elements as discussed in the preceding rejection above, these limitations would be met.

Regarding the argument the examiner's conclusion in claim 1 is based on improper hindsight reasoning.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Regarding the argument Oto does not disclose a single highpass filter but instead a highpass filter and a lowpass filter.

The applicant is reminded the word "comprising" on line 1 of claim 1. The interpretation is clearly consistent with the structure shown in Fig. 4 of the present invention. The examiner further notes that if this limitation had been interpreted as argued by the applicant, the claims would have been subjected to restriction requirements, i.e., species 1: claim 2 (Fig. 1), species II: claim 3 (Fig. 3), species III: claim 4 (Fig. 4), species IV: claim 5, species V: claim 6 (Fig. 6), species VI: claim 7 (Fig. 7).

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Regarding the request for a documentary evidence the fact the examiner takes Official Notice: a well-known fact that using digital control via a microprocessor for the purpose of tuning channels in household TV sets are popular and well-known practice.

The examiner notes that such a method is disclosed in US Patent No. 5,822,687, cited in the PTO-892 in the previous Office action.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh Nguyen whose telephone number is **571-272-1748**. The examiner can normally be reached on Monday, Tuesday, Thursday, Friday 7:00-5:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Callahan can be reached on 571-272-1740. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



12/3/04

Minh Nguyen  
Primary Examiner  
Art Unit 2816